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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,731	07/31/2001	Mohamed Imam	ONS00187	1255

7590

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EXAMINER

ROMAN, ANGEL

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,731

Applicant(s)

IMAM ET AL.

Examiner

Angel Roman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amdt B.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21 and 23-29 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to because the lines and numbers defining the drawings are blurred and not clearly legible. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

2. **Correction of Informalities -- 37 CFR 1.85**

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

3. **Corrections other than Informalities Noted by Draftsperson on form PTO-948.**

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

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Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 21 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rumennik et al. U.S. Patent 6,168,983 B1.

Rumennik et al. discloses a method of making a semiconductor device comprising; providing a substrate (16, 121) having a surface and a diffused region of a second conductivity type (P-substrate) for forming a channel of the semiconductor

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device; forming a drain (17, 123) of a first conductivity type at the surface for electrically coupling a drain electrode to the channel; growing an oxide (40, 125) over the drain (17, 123); and introducing dopants of a second conductivity type through the oxide (40, 125) between the channel and the drain electrode to form a first charge balancing layer within the drain and at the surface (see figures 4 and 11a-11c). Rumennik et al. also discloses introducing dopants of the second conductivity type through the oxide 125 to form multiple charge balancing layers within the drain and under the first charge balancing layer (see figure 4). A gate region 12 is formed overlying the oxide (125, 40). A diffused region 15 of the second conductivity type is formed in the substrate. A first conductivity type source diffusion region 14 is formed in the diffused region 15. A drain diffusion region 19 is formed at the surface of the drain (17, 123). Introducing the dopants may include forming two laterally separated island of dielectric material of a desire thickness, at the top of the substrate within the drain and masking the dopants with the islands to form the first charge balancing layer (see column 9, lines 59-65).

Rumennik et al. is applied as above but lacks anticipation on disclosing oxide 125 being less than 1000 Å in thickness. Rumennik et al. discloses that oxide 125 thickness variations can be utilized to obtain a desire charge balancing layer depth (see column 10, lines 34-38), therefore, it would have been obvious to one having ordinary skills in the art at the time the invention was made to select a thickness of less than 1000 Å for oxide 125 in order to obtain a desire charge balancing layer depth as clearly suggested by Rumennik et al..

Allowable Subject Matter

7. Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record either singularly or in combination failed to anticipate or render obvious the limitations of forming the drain region using two implant steps with different dopant concentration to form the drain region with a second laterally offset area as required by claim 22. In the examiners opinion, it would not have been obvious to one having ordinary skills in the art at the time the invention was made to form the drain region in the primary reference of Rumennik et al. using the method disclosed in claim 22.

Response to Arguments

9. Applicant's arguments, see pages 6-7, filed 06/11/03, with respect to claims 21-29 have been fully considered and are persuasive. The final rejection of claims 21-29 has been withdrawn.

10. Applicant's arguments with respect to claims 21-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hossain et al., Imam et al., Okada, Murakami, Rumennik, Hsu et al., Fujihira and Tukizi disclose methods of making semiconductor devices comprising charge balancing layers within the drain region.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (703) 306-0207. The examiner can normally be reached on Monday-Friday 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

AR
July 2, 2003


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800